A SHOCK ATTENUATION METHOD AND SYSTEM OF ELASTIC INSOLE OF SHOES

Technical field

[01] The present invention relates to parts and method of shoes, and more particularly, to shock attenuation method and system for elastic insole of shoes.

Background Art

[02] In the prior art shock attenuation elastic insole of shoes, some shoes have springs set in the hollow interior of the insole, some shoes have a circulating flow pressure controlling mechanism or a bi-directional flow pressure controlling mechanism. But different people may have different body weights, and the same person may take different activities such as an ordinary walk or a strenuous exercise etc, therefore, from the view of being most cozy to human body, the demand for the shock attenuation capability at different occasions or for the different persons are variable. But according to the prior art designs, the shock attenuation and damping-effect capability of the elastic insole of shoes is not adjustable, and therefore it can hardly satisfy the human requirements.

Summary of Invention

[03] The present invention aims to provide a shock attenuation method and system of elastic insole of shoes for adjusting elastic force, so as to solve the problem in the prior art designs that shock attenuation and damping effect is not adjustable, and to satisfy requirements of the human body to the utmost extent.

[04] The shock attenuation method of elastic insole of shoes according to the present invention is as follows: a pressure controller in the elastic insole of shoes has at least two pressure controlling modes, and by adjusting with a screw element, a user may choose to open or close either one of the two pressure controlling modes.

[05] Said pressure controlling modes include a multi-pipe circulating flow pressure controlling mode and a single-pipe bi-directional flow pressure controlling mode.

[06] Said method is realized by a shock attenuation system of elastic insole of shoes including an insole body, said insole body has a pressure controller located at its side, wherein said pressure controller includes a multi-pipe circulating flow pressure controlling means and a single-pipe bi-directional flow pressure controlling means, and an adjusting device is further installed between said multi-pipe circulating flow pressure controlling means and single-pipe bi-directional flow

pressure controlling means, and said adjusting device controls the startup of either one of said two pressure controlling means according to user's choice;

[07] Said multi-pipe circulating flow pressure controlling means includes a first ball valve as the entry of the flow passage and a vane valve as the exit of the flow passage;

[08] Said single-pipe bi-directional flow pressure controlling means includes a second ball valve as the access of the flow passage, and said second ball valve is equipped with a spring;

[09] Said adjusting device includes a rotation shaft and an adjusting turnbutton connected to the exterior bottom of the rotation shaft; and disc-shaped adjusting heads are sleeved on the middle part of said rotation shaft, wherein by moving said adjusting heads, the balls of the first ball valve may be laterally displaced; and an adjusting tip is set on the interior top of said rotation shaft so as to press against a ball of the second ball valve and make the ball to displace longitudinally;

[10] The number of the disc-shaped adjusting heads may be set corresponding to the number of the ball valves to be controlled.

[11] The advantages of the present invention is that, the pressure controller has at least two kinds of pressure control modes, for example, a multi-pipe circulating flow pressure control means and a single-pipe bi-directional flow pressure control means may be included. Since the shock attenuation and damping effect produced by the two flow pressure controlling means are different, the shock attenuation and damping capability of the shoes may be adjusted by choosing one of said pressure control modes in accordance with the different occasions or the different persons, so as to satisfy the requirements of the human body to the utmost extent. Since disc-shaped adjusting heads are sleeved on the middle part of said rotation shaft, by moving said adjusting heads, the balls of the first ball valve may be laterally displaced. This kind of oblique periphery design can reduce the wearing of the contacting surfaces. In addition, as the area of its bottom is rather large, it can be fixed in the shoes more effectively and the utility of the present invention is improved. A spring is set below the lower disc-shaped adjusting head, and a spring is set in the ball valve of the single-pipe bi-directional flow pressure controlling means which pushes downwards against the ball to help the positioning of the pressure controller. In addition, the springs help to reduce the displacement for controlling, namely to reduce the lifting amplitude of the rotation shaft when adjusting the shock attenuation effect, and further improve the practicability and reliability of the present invention. In all, the present invention can adjust shock attenuation and damping effect, is practical and reliable, and can satisfy the human requirements to the utmost extent.

Brief Description of the Drawings

[12] Fig.1 is a schematic view of the whole assembly of the pressure controller of the present invention;

[13] Fig.2 is a schematic view indicating parts of the pressure controller of the present invention, wherein the middle part of the figure is a partial sectional view;

[14] Fig.3 is a schematic view of the appearance of the bottom of the insole body of the present invention.

Detailed Description of the Preferred Embodiments

[15] Hereinafter the present invention will be described in details with reference to the accompanying drawings and embodiments.

[16] According to Fig. 1 and Fig. 2, the present invention includes an insole body. As shown in Fig. 3, said insole body has a pressure controller A located at its side. In this embodiment, as shown in Fig. 1 and Fig. 2, the two pressure controlling means include a multi-pipe circulating flow pressure controlling means 1 and a single-pipe bi-directional flow pressure controlling means 2, furthermore an adjusting device 3, which controls the startup of either one of said two pressure controlling means according to user's choice, is further installed between the two pressure controlling means.

[17] Wherein, the multi-pipe circulating flow pressure controlling means 1 includes a ball valve 11 as the entry of the flow passage and a vane valve 12 as the exit of the flow passage. As shown in Fig. 2, a hinge 121 is set in the vane valve 12. The single-pipe bi-directional flow pressure controlling means 2 includes a ball valve 21 as the access of the flow passage. The adjusting device 3 is used to control the alternate opening or closing of the control units of the two pressure controlling means.

[18] As shown in Fig. 2, the adjusting device 3 includes a rotation shaft 31 and an adjusting turnbutton 32 connected on the exterior bottom of said rotation shaft 31. The adjusting turnbutton 32 is fastened at the bottom outwardly with respect to the ball valve 11, and the adjusting turnbuttuon 32 is engaged with the rotation shaft 31 by screw threads. A concave 4 is set correspondingly for mounting the adjusting turnbutton 32. A leak resistant ring is set between the adjusting trunbutton 32 and the rotation shaft 31, and a cage nut 315 is set on the leak resistant ring 314. Disc-shaped adjusting heads 311 are sleeved on the middle part of said rotation shaft 31, and by moving said adjusting heads, the ball 111 of the ball valve 11 may be laterally displaced.

A spring 313 is set below the lower disc -shaped adjusting head 311. An adjusting tip 312 is set on the interior top of said rotation shaft 31 so as to press against a ball 211of the ball valve 21 and to make the ball 211 displace longitudinally. A spring 212 is set within the ball valve 21 so as to downwardly push against the ball 211.

[19] In the present invention, the adjusting device 3 controls the opening or closing of the ball valve 11 of the multi-pipe circulating flow pressure controlling means 1 and the ball valve 21 of the single-pipe bi-directional flow pressure controlling means 2 alternately by a screw element. As shown in Fig. 1 and Fig. 2, the rotation shaft 31 is moved upwards by adjusting the turnbutton 32. And in the multi-pipe circulating flow pressure controlling means 1, the ball 111 is moved outwards till the ball valve 11 is closed. In the mean time, in the single-pipe bi-directional flow pressure controlling means 2, the ball 211 is pushed away from the access of the ball valve 21 by the adjusting tip 312, thereby, the single-pipe bi-directional flow pressure controlling means 2 is opened and the multi-pipe circulating flow pressure controlling means 1 is closed. In contrary, as shown in Fig. 1 and Fig. 2, the rotation shaft 31 is moved downwards by adjusting turnbutton 32. In the single-pipe bi-directional flow pressure controlling means 2, the ball 212 is moved downwards till it blocks the access of the ball valve 21. In the mean time, in the multi-pipe circulating flow pressure controlling means 1, the ball 111 returns toward the center, thereby, the ball valve 11 is opened, that is to say that the multi-pipe circulating flow pressure controlling means 1 is opened and the single-pipe bi-directional flow pressure controlling means 2 is closed. In such a way, the ball valves 11 and 21 are opened and closed alternately by adjusting turnbutton 32. It could be seen from the above that the adjusting device 3 controls the opening or closing of the control valves of the two kinds of pressure controlling modes by a screw element. In such a way, the present invention introduces a multi-pipe circulating flow pressure controlling mode by the multi-pipe circulating flow pressure controlling means 1 and a single-pipe bi-directional flow pressure controlling mode by the single-pipe bi-directional flow pressure controlling means 2, and one of said pressure controlling modes is selected to be opened or closed alternately by a screw element. The multi-pipe circulating flow pressure controlling means 1 or single-pipe bi-directional flow pressure controlling means 2 of the present invention could be a pressure controlling means for liquid or gas flow.

[20] In practical use, the number of the disc-shaped adjusting heads 311 may be set corresponding to the number of the ball valves to be controlled.

[21] In this embodiment are described in details the principle, structure and working process of the two pressure controlling modes adopted in the pressure controller A, namely the multi-pipe circulating flow pressure controlling mode and the single-pipe bi-directional flow pressure

controlling mode. Similarly, the pressure controller A could adopt two different kinds or more than two kinds of pressure controlling modes as well. As for the principle and structure, they are same as or similar to the above description, which could be implemented by a technical person in this field without creative work. Therefore, it is not necessary to describe in details here.